



Application No.: 10/713,017
Examiner: B. J. Buss
Art Unit: 2129

LIST OF CURRENT CLAIMS

1-8 (Cancelled)

9 (Currently Amended) A numerical control apparatus for controlling machinability data selection in a machining environment, comprising:

means operative in response to input data of a workpiece, the input data comprising workpiece characteristic data including at least a material type and hardness of the workpiece;

means of performing fuzzification of said input data to produce fuzzy input data;

an inference component operative to produce fuzzy output data from said fuzzy input data, the inference component including a multilayer neural network and fuzzy control means for applying a set of predefined fuzzy rules to said fuzzy input data as to produce said fuzzy output data, wherein the fuzzy output data comprises machining conditions including at least cutting speed and at least one of depth of cut ~~or~~ and feed rate data;

means of performing defuzzification of said output data to produce crisp output data; and

means of conveying said crisp output data to said machining environment.

10. (New) The numerical control apparatus according to claim 9, wherein said fuzzy rules are optimized according to a genetic algorithm.

11. (Cancelled)

12. (New) The numerical control apparatus according to claim 11, wherein said multilayer neural network comprises a network of summation neurons and product neurons.

13. (New) The numerical control apparatus according to claim 9, wherein said input data further comprises tool characteristic data and machining condition data.

14. (New) The numerical control apparatus according to claim 9, wherein said input data further comprises cutting speed data, feed rate data, tool material data, and depth of cut data.

15. (New) A numerical control apparatus for controlling machinability data selection in a machining environment, comprising:

means operative in response to input data of a workpiece, the input data comprising workpiece characteristic data including at least a material type and hardness data of the workpiece and depth of cut data;

an inference component including a multilayer neural network operative to produce output data according to said input data, the multilayer neural network comprising a network of summation neurons and product neurons, the output data comprising machining condition data including at least cutting speed data; and

means of conveying said output data to said machining environment.

16. (New) The numerical control apparatus according to claim 15, wherein said input data further comprises tool characteristic data and machining condition data.

17. (New) The numerical control apparatus according to claim 15, wherein said input data further comprises cutting speed data, feed rate data, tool material data, and depth of cut data.